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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/914,212	08/23/2001	Gordon Lee Ellis	P 0282782	1779

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EXAMINER	
SHOSHO, CALLIE E	
ART UNIT	PAPER NUMBER
1714	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/914,212	ELLIS ET AL.	
	Examiner	Art Unit	
	Callie E. Shosho	1714	

-- The MAILING DATE of this communication appears on the cov r sheet with the correspondenc address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 August 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *21-39* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *21-39* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 25 and 30 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

(a) Claim 25, which depends on claim 21, recites, "the hydrophobic polymer comprises a hydrophobic acrylic polymer and a hydrophobic polyurethane polymer". The scope of the claim is confusing because from claim 21 it appears that only one, i.e. "a hydrophobic polymer", is present while claim 25 recites a mixture of hydrophobic polymers. Does claim 25 refer to a mixture of two polymers or does it refer to a graft or block copolymer, for instance, which comprises both polymers? Clarification is requested.

Further, if mixtures are encompassed within the scope of the claim, does the number average molecular weight of claim 21 refer to the number average molecular weight of each hydrophobic polymer or does it refer to the combined number average molecular weight of both polymers?

(b) A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. Note the

explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949).

In the present instance, claim 30, line 4 recites the broad recitation "0.1 to 10 parts component (b)", and the claim also recites "more preferably 1-10 parts" which is the narrower statement of the range/limitation.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an

international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

4. Claims 21-24, 26, 31, and 34-39 are rejected under 35 U.S.C. 102(e) as being anticipated by Overbeek et al. (U.S. 5,962,571).

Overbeek et al. disclose aqueous composition comprising hydrophilic polymer which has number average molecular weight of 5,000-50,000, hydrophobic polymer which has number average molecular weight greater than 50,000 and glass transition temperature of –20 to 50^0 C, and pigment. The hydrophilic polymer is obtained from acid monomers. It is further disclosed that the composition is suitable for use as an ink which clearly encompasses ink jet inks which would inherently be printed using ink jet printer which inherently contains cartridge to store the ink (col.7, lines 24-27 and 44-46, col.8, lines 8-10 and 57-64, and col.11, lines 32-37, 52, and 55).

In light of the above, it is clear that Overbeek et al. anticipate the present claims.

5. Claims 21-24, 26, 30, 31-32, 34, and 37 are rejected under 35 U.S.C. 102(e) as being anticipated by Beck et al. (U.S. 5,932,629).

Beck et al. disclose printing ink comprising first polymer which is obtained from (meth)acrylates, i.e. hydrophobic polymer, and has number average molecular weight of 5×10^4 to $5x\ 10^5$ and second polymer which is obtained from (meth)acrylic acid, i.e. hydrophilic polymer, and has number average molecular weight of 500-20,000, pigment such as carbon

black, and water. It is disclosed that the composition comprises 5-30% first polymer and second polymer, 5-30% pigment, and 40-90% water (col.4, lines 55-58, col.5, lines 3-8, 27-34, and 43-45, and col.6, lines 12-15 and 23-31).

In light of the above, it is clear that Beck et al. anticipate the present claims.

6. Claims 21-24, 26, 28, 30-32, and 35-39 are rejected under 35 U.S.C. 102(e) as being anticipated by Anton et al. (U.S. 6,005,023).

Anton et al. disclose ink jet ink comprising 0.1-25% graft copolymer which has weight average molecular weight of 5,000-100,000 and comprises 50-90% hydrophobic polymeric backbone and 10-50% hydrophilic macromer sidechain which has weight average molecular weight of 1,000-30,000, 70-99.8% water, and 0.1-8% pigment such as carbon black. The ink has viscosity of 1-10 cP and is filtered through 1 micron filter. It is noted that the hydrophobic polymer is obtained from monomers such as methyl methacrylate which possesses glass transition temperature of 105 ^{0}C (col.2, lines 10-32 and 60-67, col.3, lines 13-47, col.4, lines 27-28, col.5, lines 44-46, col.7, lines 24-34, and col.12, lines 17-19).

It is noted that while Anton et al. disclose weight average molecular weight of the graft copolymer and hydrophilic polymer (sidechain), there is no disclosure of the weight average molecular weight of the hydrophobic polymer (backbone). However, given that the graft copolymer which comprises hydrophobic polymer and hydrophilic polymer has weight average molecular weight of 5,000-100,000 and the hydrophilic polymer alone has weight average molecular weight of 1,000-30,000, it is clear that the weight average molecular weight of the hydrophobic polymer must range from 4,000-70,000.

Further, it is noted that Anton et al. disclose weight average molecular weight not number average molecular weight as presently claimed. However, given the relationship between weight average molecular weight (M_w) and number average molecular weight (M_n), i.e. $M_w/M_n \geq 1$, it is clear that number average molecular weight for the hydrophilic polymer and hydrophobic polymer will overlap the number average molecular weight presently claimed.

In light of the above, it is clear Anton et al. anticipate the present claims.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any

evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Beck et al. (U.S. 5,932,629) in view of Belmont et al. (U.S. 5,851,280).

The disclosure with respect to Beck et al. in paragraph 5 above is incorporated here by reference.

The difference between Beck et al. and the present claimed invention is the requirement in the claim that the carbon black carries ionic groups.

Belmont et al., which is drawn to ink composition , disclose the use of carbon black which possesses attached ionic groups in order to produce carbon black with increased dispersability (col.7, lines 15-21 and col.8, lines 9-24).

In light of the motivation for using carbon black which carries ionic groups disclosed by Belmont et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such carbon black in the ink of Beck et al., and thereby arrive at the claimed invention.

10. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Anton et al. (U.S. 6,005,023) in view of Yang (U.S. 5,594,044).

The disclosure with respect to Anton et al. in paragraph 6 above is incorporated here by reference.

The difference between Anton et al. and the present claimed invention is the requirement in the claim of polyurethane.

Yang, which is drawn to ink jet ink, discloses the use of polyurethane which has molecular weight of 5,000-50,000 as a binder (col.3, line 65-col.4, line 15).

In light of the motivation for using polyurethane disclosed by Yang as described above, it therefore would have been obvious to one of ordinary skill in the art to use such polyurethane in the ink of Anton et al. in order to strongly adhere the ink to substrate, and thereby arrive at the claimed invention.

11. Claims 27 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Anton et al. (U.S. 6,005,023) in view of Shioya et al. (U.S. 4,732,613).

The disclosure with respect to Anton et al. in paragraph 6 above is incorporated here by reference.

The difference between Anton et al. and the present claimed invention is the requirement in the claims regarding the amount of divalent and multivalent metal ions present.

Shioya et al., which is drawn to ink jet ink, disclose that the presence of divalent and higher valent metal ions are most responsible for clogging of printer nozzles, formation of precipitates during storage of inks, and deposition of foreign matter on printer heating heads. In order to avoid these problems, Shioya et al. disclose removing metal ions from the ink by ion

exchange, filtration, etc. in order to produce ink with less than 20 ppm divalent or higher valent metal ions (col.1, lines 57-61, col.2, lines 15-28, and col.4, lines 59-68).

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to control the level of the divalent and multivalent metal ions present in the ink of Anton et al. to amount less than 20 ppm in order to produce an ink which has good storage stability, produces no clogging, and does not form deposits on the printer head, and thereby arrive at the claimed invention.

12. Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Anton et al. (U.S. 6,005,023) in view of Osumi et al. (U.S. 5,976,233).

The disclosure with respect to Anton et al. in paragraph 6 above is incorporated here by reference.

The difference between Anton et al. and the present claimed invention is the requirement in the claim that the carbon black carries ionic groups.

Osumi et al., which is drawn to ink jet inks, disclose the use of carbon black with attached ionic groups in order to produce ink which does not require a dispersant and does not exhibit increase in the particle size of the pigment or viscosity even when stored for long periods of time (col.3, lines 35-52 and col.4, line 61-col.5, line 4).

In light of the motivation for using carbon black which carries ionic groups disclosed by Osumi et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such carbon black in the ink of Anton et al., and thereby arrive at the claimed invention.

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Yamamoto et al. (U.S. 5,428,088) disclose composition comprising acrylic resin and urethane resin, however, there is no disclosure of number average molecular weight of the polyurethane.

Listigovers et al. (U.S. 5,760,124) disclose ink jet ink comprising block copolymer comprised of hydrophilic polymer and hydrophobic polymer, however, there is no disclosure of the number average molecular weight of either the polymer.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 703-305-0208. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 703-306-2777. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Callie E. Shosho
Examiner
Art Unit 1714

CS
January 30, 2003